

**REMARKS**

In the Office Action, the Examiner rejected claims 1-11 and 17-22. By this paper, Applicant cancelled claim 17 and amended claims 7-11 and 18-22 for clarification of certain features to expedite allowance of the present application. These amendments do not add any new matter. Upon entry of the amendments, claims 1-11 and 18-22 remain pending in the present application and are believed to be in condition for allowance. In view of the foregoing amendments and the following remarks, Applicant respectfully requests reconsideration and allowance of all pending claims.

**Support for Claim Amendments**

One of ordinary skill in the art would understand that the amendments to independent claim 7 and its dependent claims are plainly supported by the present specification. *See, e.g.*, Specification, pages 4-5, ¶¶ 19-23. Such an artisan would appreciate that the claimed first step of producing polymer having a first (lower) melt index may be performed in a polymerization reactor (e.g., loop reactor 10), and that the operating conditions of the polymerization reactor (e.g., loop reactor 10) can then be adjusted to transition to the claimed second step producing polymer having a second (higher) melt index. *See* Application, Figure 1. Exemplary operating conditions that impact melt index of the polymer include reactor temperature, ethylene concentration, reactor residence time, catalyst productivity, and hydrogen concentration, and so forth. *See* Application, page 5, ¶ 20. Further, “[n]umerous methods are well known in the art for controlling the melt index of the polymer produced.” *Id.* Clearly, the amendments to

the claims do not add new matter and are not indefinite (i.e., *not* insolubly ambiguous). Moreover, as explained in the present specification, a purpose of the claimed first and second steps is to smooth the reactor wall, and to therefore, reduce the amount of fine particles or “fines” generated in the subsequent polymer slurry circulating in the reactor. *See, e.g.*, Specification, pages 4-5, ¶¶ 19-23.

As discussed in the present specification, reactor walls that are smoother (having a lower friction factor) are less likely to break the circulating polymer particles (upon contact) into smaller particles or “fines.” *See, e.g.*, Specification, pages 4-5, ¶¶ 19-23. To smooth the reactor wall so to avoid fines generation, certain embodiments of the present techniques provide a first polymerization step that produces polymer particles having a relatively lower melt index (which are relatively hard and which are believed to scuff and smooth the wall as the polymer slurry circulates in the reactor), and then to provide a second step that produces polymer particles having a higher melt index (which are relatively softer and which may smear and coat rough spots on the wall to further reduce the friction factor of the wall). *See id.* In view of the foregoing, Applicant respectfully emphasizes that the claim amendments are fully supported by the present specification. *See, e.g.*, Specification, pages 4-5, ¶¶ 19-23.

**Claim Rejections under 35 U.S.C. § 102**

In the Office Action, the Examiner rejected claims 7-8 and 10 under U.S.C. § 102(e) as being anticipated by Bodart et al. (U.S. 2004/0029727 A1). Applicant respectfully traverses this rejection.

***Legal Precedent***

During patent examination, the pending claims must be given an interpretation that is reasonable and consistent with the specification. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (citations omitted).

Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). Indeed, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Furthermore, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (emphasis added). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.*

***Deficiencies of the Rejection – Independent Claim 7***

Independent claim 7, as amended, generally recites a method of reducing a friction factor of an inner surface of a loop reactor, the method including a first step where polymer particles (having a melt index greater than 0.4 gm/10) smooth the inner wall of the loop reactor, and a second step where polymer particles (having a melt index less than 0.3 gm/10) smear and coat roughs spots of the inner wall. The two steps are performed at respective lengths of time such that the root mean square surface roughness of the inner surface of the loop reactor is reduced to less than about 120 micro inches.

In stark contrast, the Bodart et al. reference (hereinafter “Bodart”) cited by the Examiner is absolutely devoid of these features. Instead, Bodart is directed to a process for producing catalyst. *See Abstract*. In evaluating the catalyst, Bodart tests the catalyst by performing polymerizations in a small batch autoclave reactor in the laboratory. *See page 4, ¶ 61*. Bodart merely depicts the melt index of the produced polyethylene polymer as a function of temperature. *See Figures 3 and 4*. Bodart discloses nothing about a two

step polymerization configured to smooth the inner surface of a loop reactor, as presently claimed. After all, the Bodart reference is not concerned with the friction factor of an inner surface of a loop reactor. Indeed, again, the Bodart polymerizations are conducted in a small autoclave batch reactor, and not a loop reactor. Moreover, Bodart discloses nothing about the timing of the polymerization of any polymer at a particular melt index, much less timing for each step to smooth and reduce the friction factor of a surface of a loop reactor. Lastly, Applicant stresses that the features recited in claim 7 are *not* inherent in Bodart. To be sure, such features are *not necessarily present* in Bodart.

In view of the foregoing, Bodart cannot anticipate independent claims 7 or its dependent claims. Accordingly, Applicant respectfully request the Examiner withdraw the rejection under 35 U.S.C. § 102(e) of claims 7, 8, and 10.

**Claim Rejections under 35 U.S.C. § 103(a)**

The Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as obvious over Rohlfing et al. (U.S. Patent No. 3,244,681); claims 9 and 11 under 35 U.S.C. § 103(a) as obvious over Bodart et al. (US 2004/0029727 A1); and claims 17-22 under 35 U.S.C. § 103(a) as obvious over Bodart et al. in view of Rohlfing et al. . Applicant respectfully traverses these rejections. As a preliminary matter, Applicant notes that the Examiner referred to U.S. Patent No. 3,244,681 as Stanley et al., incorrectly attributing Stanley as the first listed inventor of U.S. Patent No. 3,244,681, when in fact the first listed inventor

is Rohlfing. In contrast, in the present Response, Applicants will refer to U.S. Patent No. 3,244,681 as “Rohlfing” (not “Stanley”).

### ***Legal Precedent***

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (B.P.A.I. 1979). To establish a *prima facie* case, the Examiner must show that the combination or modified reference includes all of the claimed elements, *and* also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the reference(s). *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984).

### ***Deficiencies of the Rejections – Independent Claim 1***

The Examiner acknowledged that the cited reference does not disclose “a root mean square surface roughness less than about 120 micro inches,” as recited in claim 1. *See* Office Action Mailed July 10, 2006, page 4. Nevertheless, the Examiner incorrectly asserted that because Rohlfing discloses a tubular closed loop reaction zone having smooth surfaces, it would have been obvious to one of ordinary skill in the art to polish the inner surface of the Rohlfing loop reactor to a root mean square surface roughness

less than about 120 micro inches. *See id.*, at 5. However, the Examiner did *not* provide objective evidence of such obviousness. Further, the Examiner apparently did not provide a modification of the reference. To be sure, the Examiner did not provide a convincing line of reasoning of any modification of the cited reference. Moreover, if the Examiner relied on the principle of inherency, he did not show that the Rohlfing surfaces *necessarily* possess a root mean square surface roughness less than about 120 micro inches. Clearly, in all respects, the Examiner has fallen short of meeting his evidentiary burdens.

The Examiner awkwardly contended that “although [Rohlfing] may not use the same units for measuring smoothness or roughness, applicants must recognize that the recited ‘root mean square surface roughness’ is merely a functional language for gauging roughness or smoothness that does not lend itself to patentability.” *See* Office Action Mailed July 10, 2006, page 4. First, Applicant notes that the cited reference employs no units for smoothness or roughness, but merely states that the surface of the Rohlfing reactor is smooth. *See* Rohlfing, col. 1, lines 60-65. Such a nonspecific statement in Rohlfing does not teach or suggest the polished-like finish of a surface having a roughness less than about 120 micro inches, as claimed. Further, as indicated in the present specification, Applicant believes that the walls of loop reactors (such as the Rohlfing reactor) in the prior art possess a roughness *greater* than 125 micro inches. *See* Application, page 7, ¶ 28. Indeed, Applicant believes that the roughness of the Rohlfing

is well above 125 micro inches (far outside of the claimed range) when considering the age of the reference.

Second, Applicant traverses the Examiner's contention that the presently-recited unit of roughness is merely functional language not lending itself to patentability. After all, a degree of smoothness (which may be expressed in units of roughness as is typical in the pertinent art) of a surface of the polymerization reactor is plainly patentable. The present application discloses and claims specific processes for conducting polymerizations in reactors having a maximum surface roughness, and also generating and maintaining such a maximum surface roughness. *See, e.g.,* Application, pages 4-5, ¶¶ 19-21.

In conclusion, while the Rohlfing reference mentions "a tubular closed loop reaction zone having smooth surfaces," the cited reference is absolutely devoid of the teaching or suggestion of a loop reactor surface having a *root mean square surface roughness less than about 120 micro inches*. *See* Rohlfing, col. 1, lines 60-65. Accordingly, claim 1 and its dependent claims 2-6 are patentable over the cited reference. Therefore, Applicant respectfully requests that the Examiner to withdraw the rejection and allow claims 1-6.



***Dependent Claims 9, 11, and 18-22***

In formulating the rejection of the dependent claims, the Examiner did not overcome the deficiencies of the Bodart et al. reference with regard to independent claim 7 discussed above. Therefore, dependent claims 9, 11, and 18-22 are patentable because of their dependency on an allowable base claim, and also by virtue of the subject matter they separately recite. Accordingly, Applicant respectfully request that the Examiner withdraw the foregoing rejections and allow claims 9, 11, and 18-22.

**Conclusion**

The Applicants respectfully submit that all pending claims should be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

***Authorization for Extensions of Time and Payment of Fees***

In accordance with 37 C.F.R. § 1.136, Applicant hereby provides a general authorization to treat this and any future reply requiring an extension of time as incorporating a request thereof. The Commissioner is authorized to charge fees for time extensions, and any additional fees which may be required, to Deposit Account No. 06-1315; Order No. CPCMC:0020/FLE/RAR/FAR (210330US).

Respectfully submitted,

Date: March 14, 2007



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